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13. ABSTRACT (Maximum 200 words) <p>Great Salt Pond is a large, nearly landlocked pond at the center of Block Island. The island is a very popular summer resort area and refuge for small boat traffic. This study was conducted under the authority of Section 107 of the River and Harbor Act of 1960, as amended, for the purpose of navigation improvement. A previously authorized Federal project called for deepening and widening the 18-foot entrance channel, and dredging a basin and an access channel in New Harbor. However, a lack of local financing prevented construction. The project was subsequently deauthorized in the Water Resources Development Act of 1986 (PL 99-566). Continued shoaling in the passage between Trims Pond and Great Salt Pond have increased local concerns for the harbor's safe navigability. For this reason, the town of New Shoreham requested the New England Division to reexamine the dredging of New Harbor. The navigation problems in Great Salt Pond, New Shoreham, Rhode Island, have been studied, and based on reconnaissance level investigations, no economically feasible solution can be developed.</p>				
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GREAT SALT POND  
NEW SHOREHAM, RHODE ISLAND

RECONNAISSANCE REPORT

February 1991  
New England Division

INTRODUCTION

The town of New Shoreham, Rhode Island, is the sole municipality occupying the island of Block Island. The island is located 10 miles south of Point Judith, Rhode Island and 14 miles east of Montauk Point, Long Island, New York. The island, a very popular summer resort area and refuge for small boat traffic, comprises an area of 11 square miles.

Great Salt Pond is a large, nearly landlocked pond at the center of the island. It is connected to Block Island Sound on the western side by a Federal navigation channel 18 feet deep at mean low water (MLW) and 150 feet wide. The Pond is bordered on its southern side by two smaller ponds, Trims Pond and Harbor Pond. One of the island's two harbors, New Harbor, is located in Trims Pond. The island's other harbor, Old Harbor, is a Federally maintained Harbor of Refuge located on the eastern side of the island, approximately 1 mile from New Harbor (see Figure 1).

A previously authorized Federal project called for deepening and widening the 18-foot entrance channel; and dredging a basin and an access channel in New Harbor. However, a lack of local financing prevented construction. The project was subsequently deauthorized in the Water Resources Development Act of 1986 (PL 99-566). Continued shoaling in the passage between Trims Pond and Great Salt Pond have increased local concerns for the harbor's safe navigability. For this reason, the town of New Shoreham, in a letter dated July 22, 1989, requested the New England Division to reexamine the dredging of New Harbor.

STUDY AUTHORITY

This study was conducted under the authority of Section 107 of the River and Harbor Act of 1960, as amended, for the purpose of navigation improvement.

EXISTING CONDITIONS

The Federally maintained channel entering Great Salt Pond is the only navigable passage into the Pond. The inlet is stabilized on its seaward side by two rock jetties. The north jetty is 350 feet long and the south jetty is 1700 feet long. A combined dredge of the Federal projects in Old Harbor and the Great Salt Pond channel was scheduled for the fall of 1989. However, due to a lack of funds, dredging was only conducted in Old Harbor. Maintenance of the entrance channel is planned to be done during the next dredging of Old Harbor, which will likely occur within the next couple of years.

Great Salt Pond is a natural anchoring area as it is landlocked and provides depths up to 50 feet deep. Most of this deep water is located from the middle to the southwest portions of the Pond. The shoreline in this area is moderately developed and contains several large recreational marinas. During the peak summer season, the Pond holds 1500 to 2000 recreational vessels.

New Harbor, located in the southeast corner of the Pond, services several recreational boating interests as well as a small commercial fishing fleet. The total number of boats based in the Trims Pond portion of New Harbor is 80; 65 of which are summer pleasure vessels. There are 15 commercial fishermen based here, 6 which fish year round. Four deeper draft commercial vessels based in Old Harbor occasionally use New Harbor as a safe refuge during storms. The port is a convenient alternative during easterly storms when these vessels are fishing to the west and navigation around the island is difficult. The port is also the most protected area on the island during a northeast storm. Also included in the study area are several service facilities: Pain's Dock, Smugglers Cove Marina, Pain's Hog Pen Marina, and the Harbor Road Yacht Basin. Several of these private businesses provide boat repairs and the sale of fuel. The island's only public boat ramp is also located in the natural channel area between Trims Pond and Great Salt Pond. A small fuel tanker, the Mobil Islander, used to offload fuel at the Pennington Sprague offloading station in Trims Pond. However, this service has been discontinued due to the less expensive alternative of bringing fuel to the island by truck via the ferry.

#### PROBLEM IDENTIFICATION

There are two navigation problems identified in Great Salt Pond. First, the entrance channel into Great Salt Pond, where a Federal project already exists, experiences a shoaling problem. A shoal develops on the lower inside portion of the channel, next to the old Coast Guard Station. This shoal is partially exposed at low tide and takes away from the channel's authorized width. This shoaling has caused several groundings in the recent past, specifically during the summer season when the Pond is most crowded. Though the groundings have caused very few damages to the recreational vessels, it is an added burden on the harbormaster's office to tow vessels free during the busy summer season.

The second problem town officials are concerned with is the shoaling of the channel and boat basin area in Trims Pond. Trims Pond and Great Salt Pond were originally separated by a narrow marsh. The channel and basin were first dredged to 15 feet at MLW by the state of Rhode Island between 1900 and 1904. These areas have been dredged several times since. Analysis of the area shows that the channel filled in at a rate of approximately 3% per year. The basin appears not to have a shoaling problem. In recent years boat traffic, specifically the passage of the fuel tanker through the area, kept a navigable passage open with depths around 9 or 10 feet below mean low water (MLW). However, since the tanker service was discontinued the channel has shoaled in so that depths average around 7 or 8 feet at MLW. Whereas most of the fleet does not have difficulty navigating the channel, some of the larger commercial boats and inexperienced recreational boaters occasionally ground out on the encroaching shoal. Two way traffic is very difficult for larger



boats. Indications are that the problem will only worsen, eventually cutting off the larger vessels from reaching the deep water (currently 13 feet deep at MLW) in the boat basin.

The town of New Shoreham also expressed concern over the increased bacterial counts that are occurring in Harbor Pond and the western branch of Trims Pond. Harbor Pond is connected to Trims Pond by a small waterway. According to locals, years ago the ponds were a popular spot for shellfishing. However, the amount of shellfish resources in the area are very limited today due to the soft and anoxic bottom material that predominates. Whereas the town has sought to eliminate as many sources of upland contamination as possible, bacteria counts remain high. In recent years the Rhode Island Department of Marine Resources has had to restrict what shellfishing there is to only a couple of months each year. The waters of portions of Trims Pond and all of Harbor Pond are classified as Type 1 or Conservation Areas. Field investigations revealed that two limited drainage points are not allowing the ponds to flush properly. The western branch of Trims Pond has a very constrictive opening under Ocean Avenue while the waterway between Trims Pond and Harbor Pond is also very narrow and has lost much of its depth over the years due to sand accretion.

#### PLAN FORMULATION

Meetings with local officials and the harbormaster were conducted in order to assess the extent of the problem and initiate coordination with all concerned parties. Questionnaires were distributed and collected from fishermen who use New Harbor and Old Harbor. Discussions were held with local marina owners. As a result, navigation data was collected, confirmed and quantified.

Knowing that maintenance of the existing Federal entrance channel into Great Salt Pond was needed and would occur within the next few years, this study focused on evaluating the possibility of modifying the existing channel dimensions. A survey of the fleet using the channel revealed that only a few vessels require 14 or 15 feet of water for safe passage. In fact, on the average a 10-foot channel meets the needs of most vessels accessing the area. Therefore, a properly maintained 18-foot deep at MLW navigation channel provides sufficient depth. Two-way traffic and its relationship to the channel width were also analyzed. Due to the low number of very large (over 100 feet in length) vessels entering the Pond, the most probable worst-case scenario to be encountered in the channel would be between one of the large schooners and the average size sailboat. Based on the beams of these vessels it was determined that a 150-foot wide channel is necessary for safe two-way passage. Again, the existing channel, maintained at its authorized width and used in an orderly fashion by the boaters, should be adequate. It was reported by the harbormaster that channel markers were repositioned this past summer in the area of the shoaling, and consequently there were no incidents of groundings or collisions in the channel. Therefore, further study of channel modifications is not warranted.

In the New Harbor area the alternative plan considered was to provide a Federally maintained channel from Great Salt Pond into Trims Pond. Based on fleet statistics provided by the town, it was determined that the

larger size vessels using the channel during the summer season would have drafts of 4 feet and beams of 12 feet. Assuming good conditions with moderate congestion, a 70-foot wide channel that provides for two-way traffic was determined to be an appropriate width. Wave conditions at New Harbor during north-northwesterly wind conditions can reach 2 feet on the average. By including factors for boat squat and safety clearance it was determined that an appropriate depth for the channel would be 8 feet deep at MLW. Layout of the channel was proposed to stay within the naturally deep water in the area and avoid the more shallow waters on the eastern side of the inlet. The proposed channel can be seen in Figure 2.

The channel improvement would be constructed using a hydraulic pipeline dredge. The dredged material would be pumped approximately 1/2 mile to Crescent Beach and used as nourishment material. Quantities were determined using depth information obtained using a sonar device and boat provided by the harbor master. Quantities and cost estimates for the proposed dredging are shown in Table 1.

The dredging of a navigation channel at New Harbor may help improve water quality in Trims and Harbor ponds slightly but it does not solve the overall problem. The western branch of Trims Pond, limited by the Ocean Avenue bridge opening, could be improved by providing either a larger opening or an additional outlet (a culvert under Ocean Avenue from the western branch to New Harbor is a possibility). The Harbor Pond connecting waterway needs to be excavated in order to give the passage a greater carrying capacity. Certain areas in Harbor Pond itself are also very shoaled and would need to be deepened. Though these types of modifications are typically prohibited in Type 1 waters, the Rhode Island Coastal Resources Management Program does allow exceptions where the activity is to enhance or preserve a designated conservation area.

#### **BENEFIT ANALYSIS**

A reconnaissance level analysis of economic benefits attributable to the channel improvement was conducted. Benefits to the project are divided into two categories, commercial and recreational.

Commercial benefits include the prevention of future storm and grounding damages. It is projected that within ten years the natural channel will have shoaled in to a degree that prevents the four fishing vessels from Old Harbor from using the basin as a safe refuge during storms. When this access is prevented it is estimated that the vessels will incur \$1,000 per vessel per year in storm damages. By providing a channel the four vessels would save \$4,000 in annual damages for years 11 to 50 of the project life. In the same way, it is projected that within ten years shoaling will cause the three deeper draft fishing vessels based in Trims Pond to experience grounding damages. It is estimated that each vessel will experience \$500 per year in damages. Providing a channel will prevent \$1,500 in damages annually for years 11 to 50 of the project life.

Recreational benefits to the project reflect the improved recreational experience that will be experienced by recreational boaters. The estimated dollar value for this benefit is calculated using the Unit Day Value method to measure the change in recreational value per person with the provision of a navigation channel. This method evaluates five

characteristics of the recreational activity: recreational experience, availability of opportunity, carrying capacity, accessibility, and environmental quality. The key characteristic in this analysis is accessibility. Based on a fleet of 65 recreational vessels and assuming a 45 day boating season and 3 persons per boat, it was determined that for years 1 to 10 of the project the annual benefit would be \$5,800 per year. For years 11 to 50, sixteen vessels with a draft of over 3 feet would be displaced due to the shoaling problem. Providing a channel would result in an annual benefit of \$9,000 for these vessels. The other 49 vessels in years 11 to 50 would be severely limited in their access of the Pond. It was determined that an annual benefit of \$6,000 would accrue to these vessels.

An added recreational benefit analyzed during this study is associated with the town's future plans to provide a wastewater pump-out station for the recreational vessels. The station is planned to be located next to the public boat ramp in the area of the proposed navigation channel. Approximately half the vessels in the Great Salt Pond study area are expected to be physically capable of accessing this station. Without the project, the narrow width and irregular path of the natural channel could prove hazardous to the increased traffic using the pump-out station. This congestion will likely cause some chafing damages. Information provided by the harbor master indicates that during the busy summer boating season approximately 860 vessels will visit the station. It is estimated that this will result in 43 chafing incidents per year, between recreational vessels. Providing a channel will eliminate these incidents. Assuming completed construction of the pump-out station by 1993, \$8,600 in benefits will accrue to the project in year 3 of the project life; yielding, after present worth and amortization, an annual benefit to the project of \$6,600. The increased environmental quality of the Pond due to the pump-out station cannot be taken as a benefit since the town intends on building this pump-out station whether or not the Corps provides the navigation improvement.

If the dredged material from New Harbor is suitable, it would be placed on Crescent Beach. The area to be nourished is a point in the beach where the ocean comes closest to encroaching on Corn Neck Road. There is no history of the road being damaged and the town does not spend any money on building any portions of the beach up. Traditionally, every few years, maintenance material is dredged from the channel in Old Harbor and pumped to this area as a precautionary measure. The town expects to continue this practice. The New Harbor dredged material could possibly be used there but it is not specifically needed due to the regular availability of the Old Harbor maintenance material. Therefore, there are no benefits to be derived from the nourishment of Crescent Beach.

A summary of the project benefits is provided in Table 2. The table shows the present worth of each benefit category and the annualized value of the benefit. Amortization over the 50 year project life is at an interest rate of 8 7/8%.

A benefit to cost analysis is shown in Table 3. Analysis determined that the channel experiences an annual shoaling rate of 3% per year. An annual maintenance cost of \$3,700 is included in the annual cost of the proposed improvement. As shown in Table 3, annual costs outweighed the

annual benefits associated with this plan of improvement.

As stated previously, the dredging plan considered is not expected to significantly improve water quality in Trims Pond and Harbor Pond. The structural improvements that could improve water quality are not beneficial to navigation. Since project justification is based on navigation improvement, further analysis of the environmental feature of improving water quality was not conducted in this study.

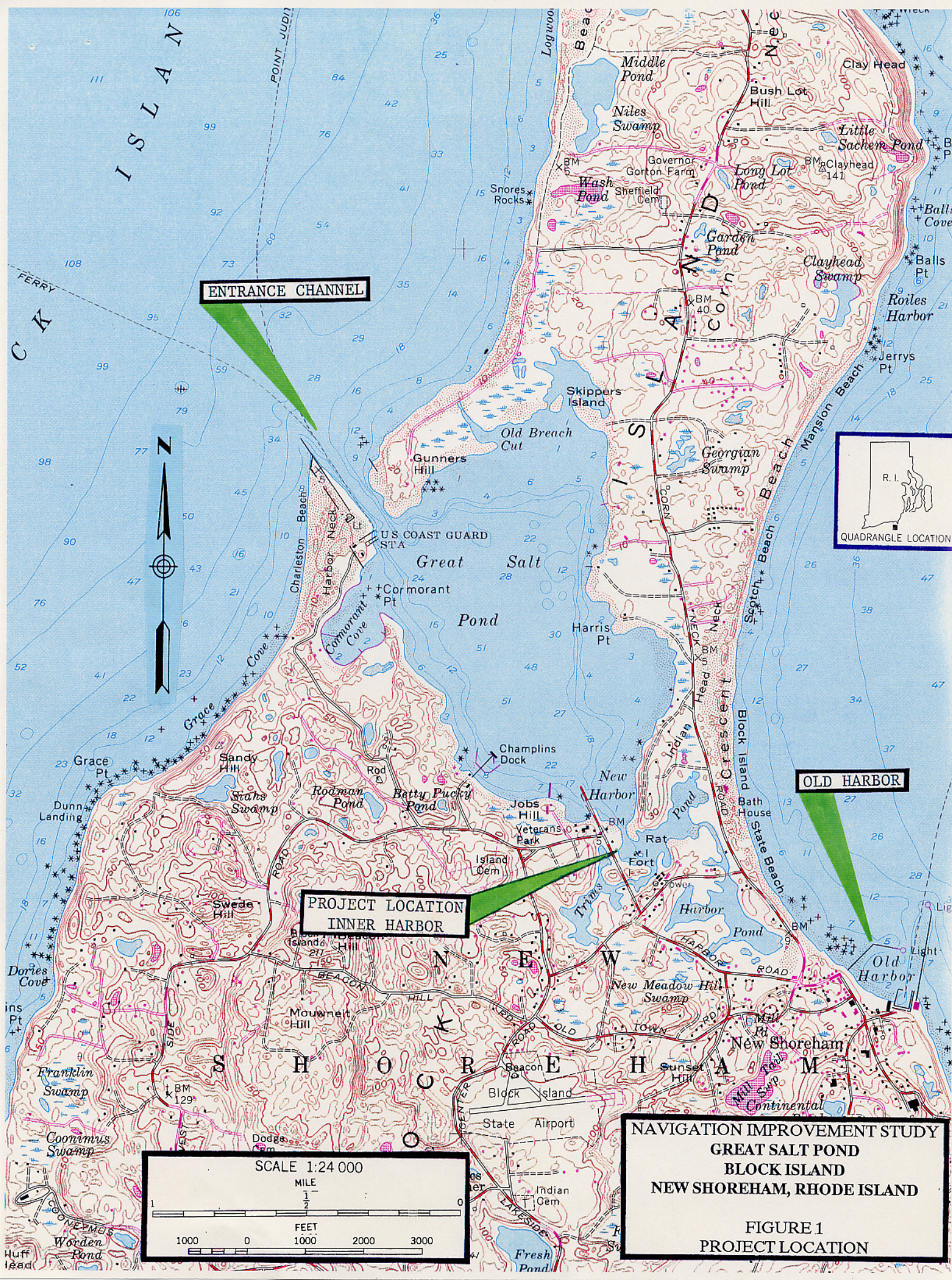
#### CONCLUSION

The navigation problems in Great Salt Pond, New Shoreham, Rhode Island, have been studied and, based on reconnaissance level investigations, no economically feasible solution can be developed.

#### RECOMMENDATION

The Division Engineer recommends no further study under the Section 107 authority at this time.

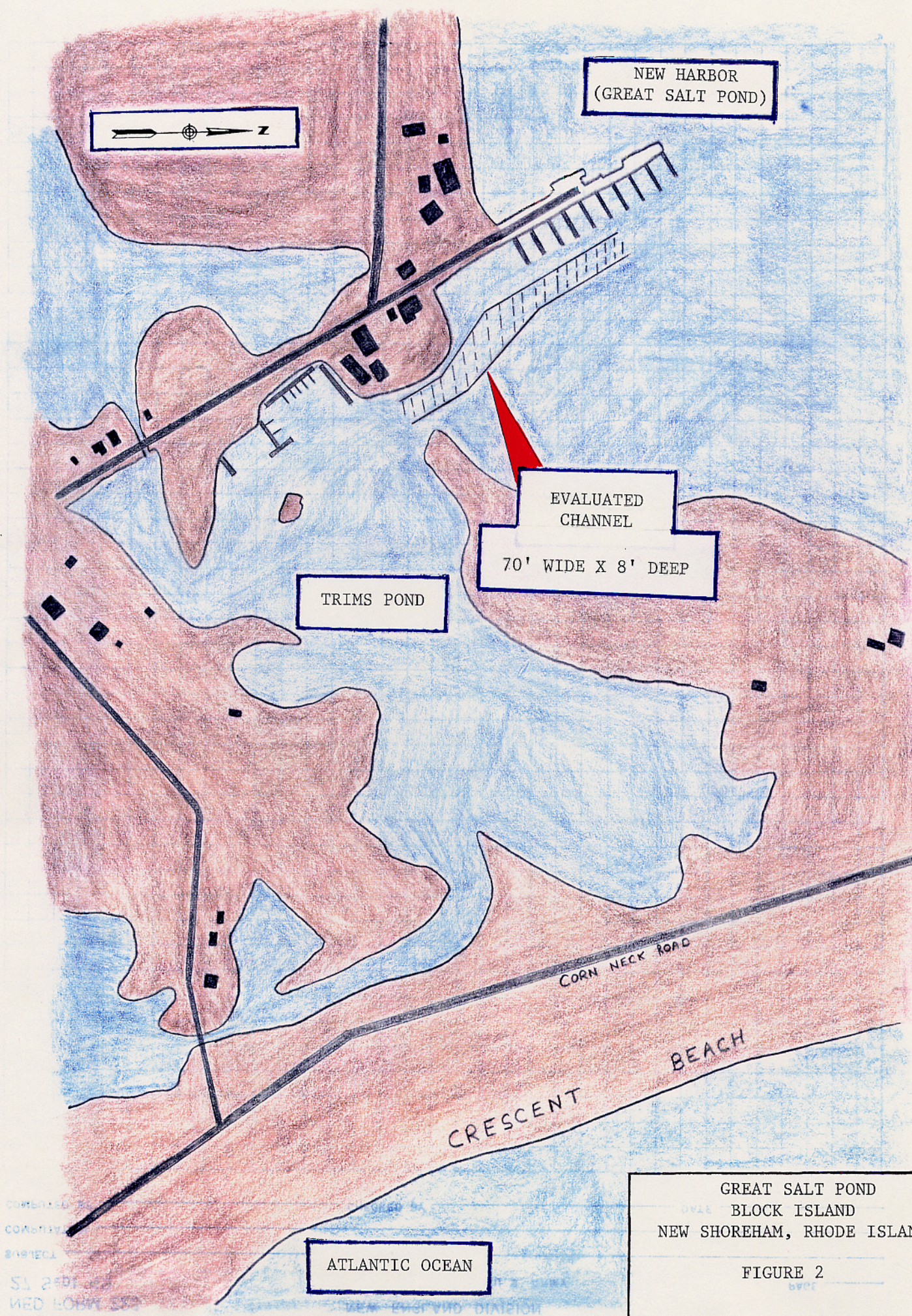




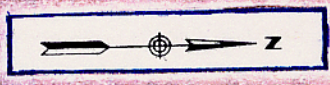
NAVIGATION IMPROVEMENT STUDY  
GREAT SALT POND  
BLOCK ISLAND  
NEW SHOREHAM, RHODE ISLAND

FIGURE 1  
PROJECT LOCATION





NEW HARBOR  
(GREAT SALT POND)



EVALUATED  
CHANNEL  
70' WIDE X 8' DEEP

TRIMS POND

CORN NECK ROAD

CRESCENT  
BEACH

ATLANTIC OCEAN

GREAT SALT POND  
BLOCK ISLAND  
NEW SHOREHAM, RHODE ISLAND

FIGURE 2



TABLE 1  
CONSTRUCTION COST ESTIMATE  
 (July 1990 price levels)

Dredging Ordinary Material: 15,000 cy @ \$10.50/cy	\$158,000
Contingencies	31,000
Planning, Engineering & Design	28,000
Construction Management	<u>35,000</u>
Total Initial Construction Cost	\$252,000
Interest During Construction	<u>0</u>
Total Investment	\$252,000

ANNUAL COSTS

Interest and Amortization (8 7/8% - 50 years)	\$ 22,700
Maintenance Dredging	<u>3,700</u>
Total Annual Cost	\$ 26,400
Say	\$ 26,000

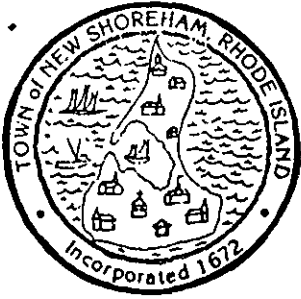
TABLE 2  
BENEFIT SUMMARY

	<u>Benefit</u>	<u>Years</u>	<u>Present Worth</u>	<u>Annual Benefit</u>
<u>Benefits To Commercial Navigation</u>				
Storm Damages Prevented	\$4,000/yr	11-50	\$18,600	\$1,700
Grounding Damages Prevented	\$1,500/yr	11-50	\$ 7,000	\$ 600
<u>Benefits To Recreational Navigation</u>				
Improved Accessibility	\$5,800/yr	1-10	\$37,400	\$3,400
	\$6,000/yr	11-50	\$26,700	\$2,400
Displacement of Vessels Prevented	\$9,000/yr	11-50	\$40,000	\$3,600
Chafing Damages Prevented	\$8,600	3-50	\$73,700	<u>\$6,600</u>
<u>TOTAL ANNUAL BENEFITS</u>				\$18,300

TABLE 3  
BENEFIT-COST ANALYSIS

Annual Costs:	\$26,000
Annual Benefits:	\$18,300
Net Benefits:	none
Benefit-Cost Ratio:	0.7





# Town of New Shoreham

P.O. Drawer 220  
Block Island, R.I. 02807

Office of the First Warden  
401-466-2913

July 22, 1989

Col Daniel M Wilson  
US Army Corps of Engineers  
424 Trapelo Road  
Waltham, MA 02254-9149

Dear Colonel Wilson:

The Town of New Shoreham (Block Island) desires to open a Planning Account with your branch to address the following modifications to Federal projects on Block Island.

1. Old Harbor
  - a) Deepening the existing Old Harbor entrance channel and anchorage.
  - b) Modifying breakwaters to reduce rate of shoaling, thereby reducing maintenance cost).
  - c) Increasing size of Old Harbor by extending or relocating existing breakwaters or constructing new breakwaters.
2. Great Salt Pond
  - a) deepening and/or widening entrance channel if necessary.
  - b) Dredging entrance channel and inner basin, Trim's Pond.

I would also like to thank Mark Habel for meeting with myself and our Harbormaster Chris Littlefield. He was very helpful in explaining procedures the Town must comply with in implementing plans that would modify federal projects on Block Island.

Sincerely,

Edward F. McGovern, Jr.  
First Warden